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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,955	02/26/2002	Jason Barnabas Langhorn	CTS-2287	5009

29184 7590 03/29/2004

CTS CORPORATION
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EXAMINER	
GEBREMARIAM, SAMUEL A	
ART UNIT	**PAPER NUMBER**
2811	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,955	LANGHORN, JASON BARNABAS	
	Examiner	Art Unit	
	Samuel A Gebremariam	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9-14 and 19-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-14 and 19-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

2. Claims 1-5, 9-15 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinds EP, 1057779A2 in view of Kainuma et al. U.S. patent No. 6,483,190.

Regarding claim 1, Hinds teaches (figs. 1, 2 and 3) a semiconductor package for a micro-machined semiconductor device (40), comprising: a) a substrate (22 and 30) having a first surface (24) and a second surface (23), the micro-machined semiconductor (40) device located adjacent the first surface (24); b) a plurality of vias (25 and 33), extending through the substrate between the first and second surfaces; c) an electrical connection (34) located between the vias and the micro-machined semiconductor device for electrically connecting the vias to the semiconductor device; d) a solder seal (refer to figs. 1 and 3), located between the micromachined semiconductor device (40) and the first surface (24) for hermetically sealing the micro-machined semiconductor device f) a plurality of solder spheres (18) mounted to the second surface (23) and electrically connected to the vias (25).

Hinds does not explicitly teach a wire bond bump located between the micro-machined semiconductor device and the first surface for supporting the micro-machined semiconductor device during assembly.

However Hinds shows in figures 2 and 3 a structure preventing the micro-machined semiconductor device from contacting the first surface (24). Furthermore the use of wire bump structures is conventional in the art and also taught by Kainuma (fig. 2b) for protecting a silicon chip (101) using bump structures (113 and 114) that are formed of gold alloy (col. 5, lines 19-52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bump structures taught by Kainuma in the structure of Hinds in order to protect the micro-machined semiconductor device.

The limitation of ultrasonically deposited wire bonds is considered a product-by-process claim. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Furthermore the limitation the wire bond bumps preventing the micro-machined semiconductor device from contacting the top surface during assembly is not given patentable weight because, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in

order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Regarding claim 2, Hinds teaches (fig. 3) substantially the entire claimed structure of claim 1 above including a first pad (44) located on the micro-machined semiconductor device; and a second pad (32) located on the first surface and a solder joint (50) between the first and second pad.

Regarding claim 3, Hinds teaches substantially the entire claimed structure of claim 1 above including the substrate is ceramic (col. 3, lines 26-32).

Regarding claim 4, Hinds teaches substantially the entire claimed structure of claim 1 above including the seal is a ring of solder located adjacent an outer perimeter of the substrate (figs 2 and 3, col. 4, lines 12-27, Hinds).

Regarding claim 9, Hinds teaches substantially the entire claimed structure of claim 1 above including the substrate has a plurality of layers (fig. 2, Hinds).

Regarding claim 10, Hinds teaches the entire claimed structure of claim 1 above including a plurality of circuit lines (26) located on the layers, the circuit lines connected between vias (20 and 25).

Regarding claim 11, Hinds teaches the entire claimed structure of claim 1 above including a ball pad (17) is attached to the second surface (15), the solder sphere (18) attached to the ball pad.

Regarding claim 12, Hinds teaches substantially the entire claimed structure of claim 1 above including the solder sphere is attached to the ball pad by a reflowed solder paste (col. 3, lines 45-47, Hinds).

Regarding claims 13 and 14, and 19-21, Hinds teaches substantially the entire claimed structure of claims 1, 3, 4 and 9 above including a solder seal ring (48) and the micro-machined semiconductor device is spaced from the top surface by the bond bumps such that a movable portion of the micro-machined semiconductor device is unconstrained for movement (col. 6, lines 45-52); and an electrical connection (34) located between the vias (33) and the micro-machined semiconductor device (40) for electrically connecting the vias to the semiconductor device.

Response to Arguments

3. Applicant's arguments with respect to claims 1-4, 9-14 and 19-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel Admassu Gebremariam whose telephone number is 703 305 1913. The examiner can normally be reached on 8:00am-4: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Samuel Admassu Gebremariam
March 19, 2004

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800